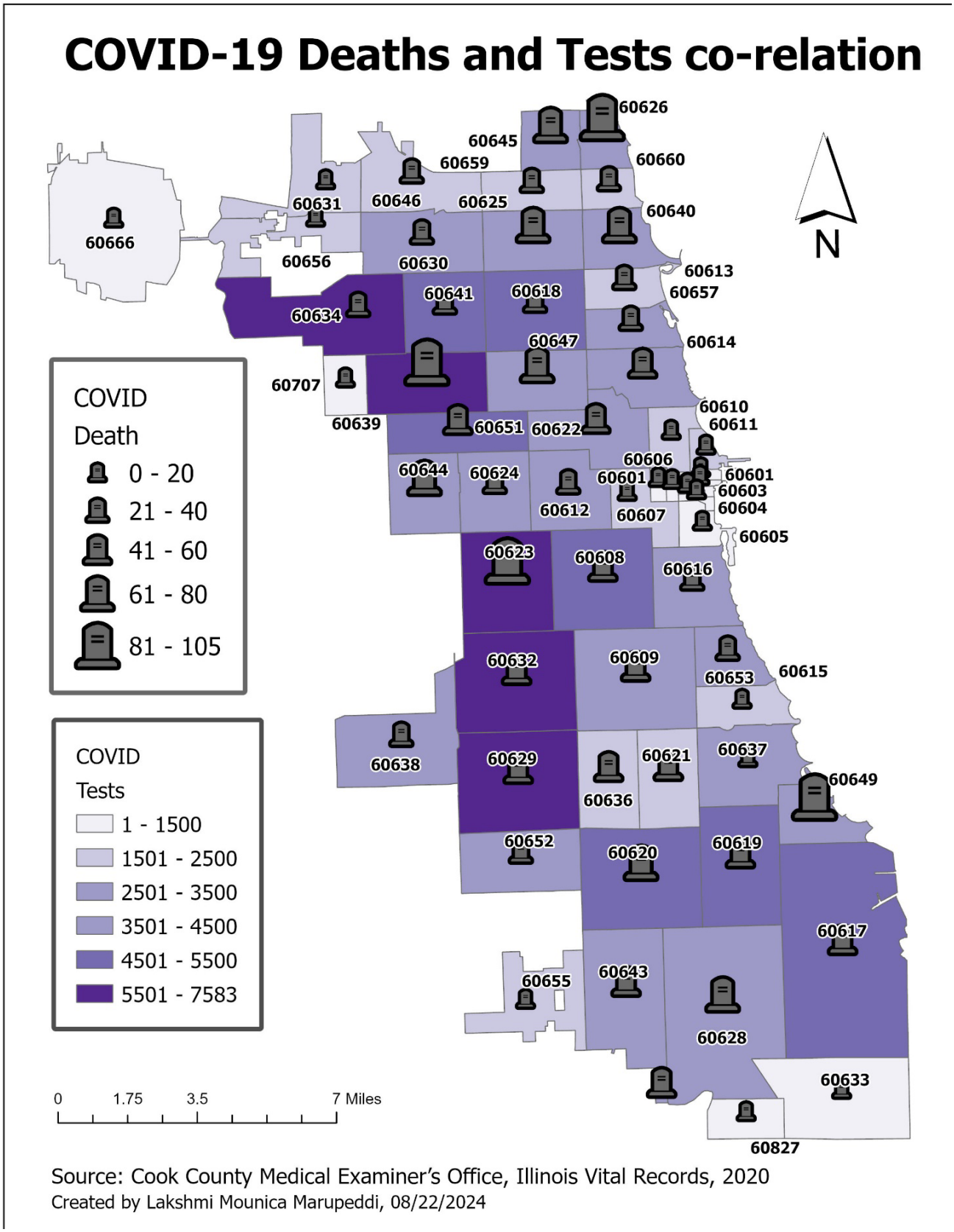
Overlay map with COVID tested cases and COVID death cases.



I chose 6 intervals for covid tests with a graduated color format and 5 intervals for covid deaths with graduated symbols. The intention is to equally distribute the ranges and maintain equal groups. In addition, I also want to capture the number

of deaths for every increment of 1000 tests to calculate the impact of changing test numbers.

MAP INTERPRETATION

This map provides a representation of relationship between number of COVID tests conducted and number of COVID deaths occurred in Chicago communities. The tests conducted are represented as graduated colors with 6 classifications. The deaths are represented as graduated symbols with 5 classifications. The main purpose of the map is to interpret the relation

COVID-19 is an infectious and contagious disease, caused by the sars-cov2 (severe acute respiratory syndrome-2) and recorded first in China in 2019 and hence the name COVID-19. The outbreak massively impacted and disrupted services, livelihoods, travel, businesses and economies and brought the world to a standstill. The virus transmits from mouth or nose of an infected person and can be contracted when inhaled or through direct contact with infected persons or surfaces through eyes, nose and mouth[1]
The symptoms include fever, cough, cold, headaches, respiratory illnesses, loss of taste or smell. On the severe end, it can cause organ failure, pulmonary illnesses or thrombosis or death. When the outbreak was announced, countries imposed full-scale quarantine measures, sanitation protocols and restricted international and domestic travel.

The impact of Covid is multifarious. Despite quarantine measures the infection spread throughout with around 7million deaths reported across the globe.[2] In addition the pandemic has caused major economic disturbances, loss of livelihoods, supply-chain disruptions, food and migrant crisis amongst others.

Looking at the data and maps of Chicago community it can be observed the zip code **60623 has the higher correlation of tests to deaths.** The co-relation value is arrived at by calculating the ratio of number of tests to deaths (tests / deaths = co-relation). The zip-code with highest value is considered to have high co-relation. **Likewise, 60611 has the lowest co-relation value. 60666 is ignored for calculation since it doesn't have proper data and the ratio results in division by zero (1/0).**

One area that showcases an anomaly is the zip code 60666 which is the zip code of O-hare. The number of cases of death is zero and population is 0 but tests is 1. A zero population cannot have more than 0 tests. However, o-hare population is certainly not 0, therefore, the table contains missing or improper data.

Timely action is crucial when it comes to dealing with heavily impacted areas, The following are some measures I propose for the hard-hit areas.

- One of the important actions to take is to replan and organize medical facilities, records and availability of resources in the hard-hit areas by the administration departments to ensure easy and safe access of services by the patients.
- Since the hard-hit areas are likely to run out of medical facilities. Medical equipment, oxygen, treatment rooms, hospital rooms and spaces should be arranged properly to assist overwhelmed hospitals.
- Another important action to be taken is to conduct aggressive testing to diagnose the virus as early as possible to prevent deaths and serious life-threatening symptoms.

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[1] Who | How COVID is transmitted
[2] https://ourworldindata.org/covid-deaths

- Providing basic necessities to the people residing in the hard-hit areas is crucial to prevent people from coming out and risking exposure. Therefore, the civic administration should accordingly plan proper dispersal of basic amenities to the houses.
- Finally, Centralizing services is an effective action. The idea is to maintain a single online portal with comprehensive coverage of all services ranging from providing critical information, medical advice, availability of testing centers, hospital beds, Doctors and a common helpline.[3]

Looking at the reasons why some zipcodes have low co-relation rates,

- The zipcodes in the places with better medical facilities and awareness are likely to have better recovery rate as they can easily access doctors and medicines.
- Areas with aggressive testing despite absence of any symptoms is another reason for a less co-relation rate.
- Another reason is that a large number of tests are negative for the zipcode area, thereby ruling out the infection, hence, less death rate.

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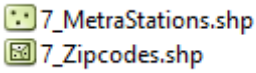
[3] https://theprint.in/india/governance/how-this-ias-officer-ensured-ailing-maharashtra-district-was-ready-to-battle-2nd-covid-wave/654340/

V. Spatial Techniques **(15 Points)**

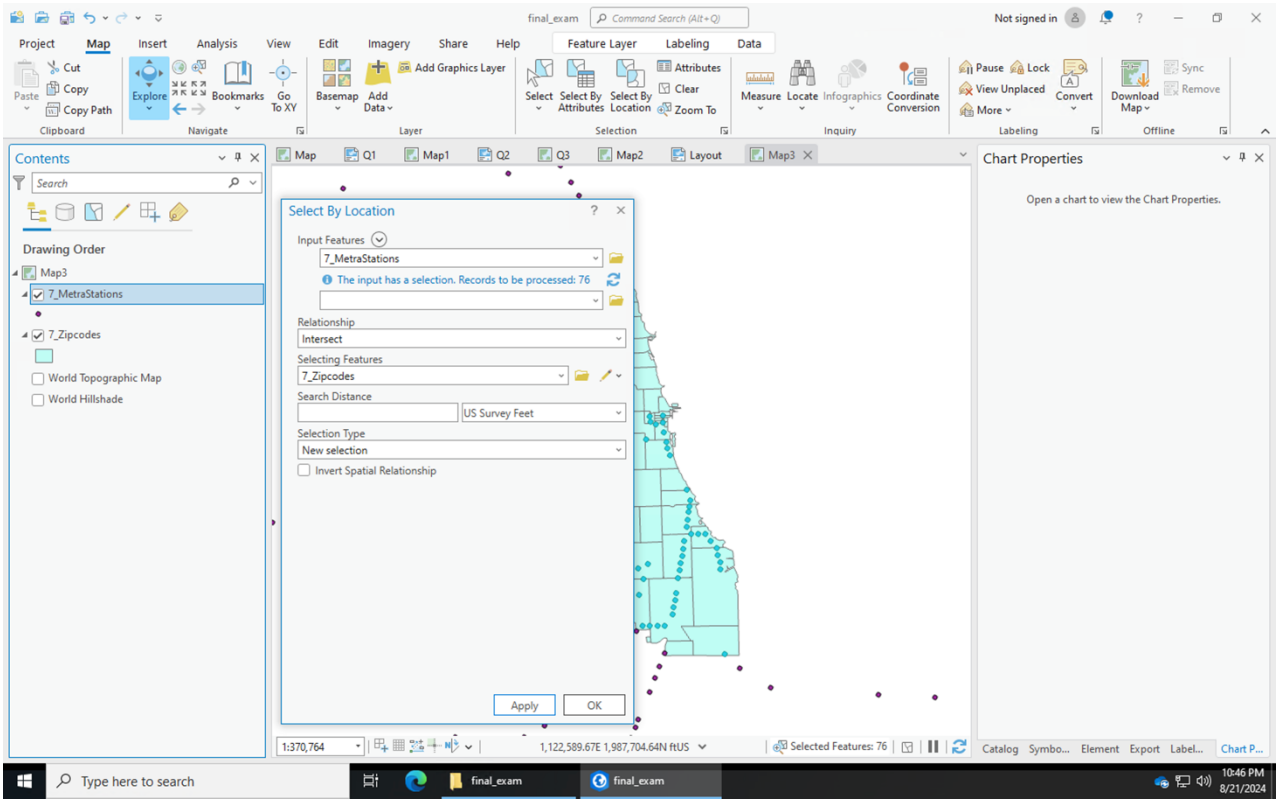
(a) shapefiles to ArcMap.



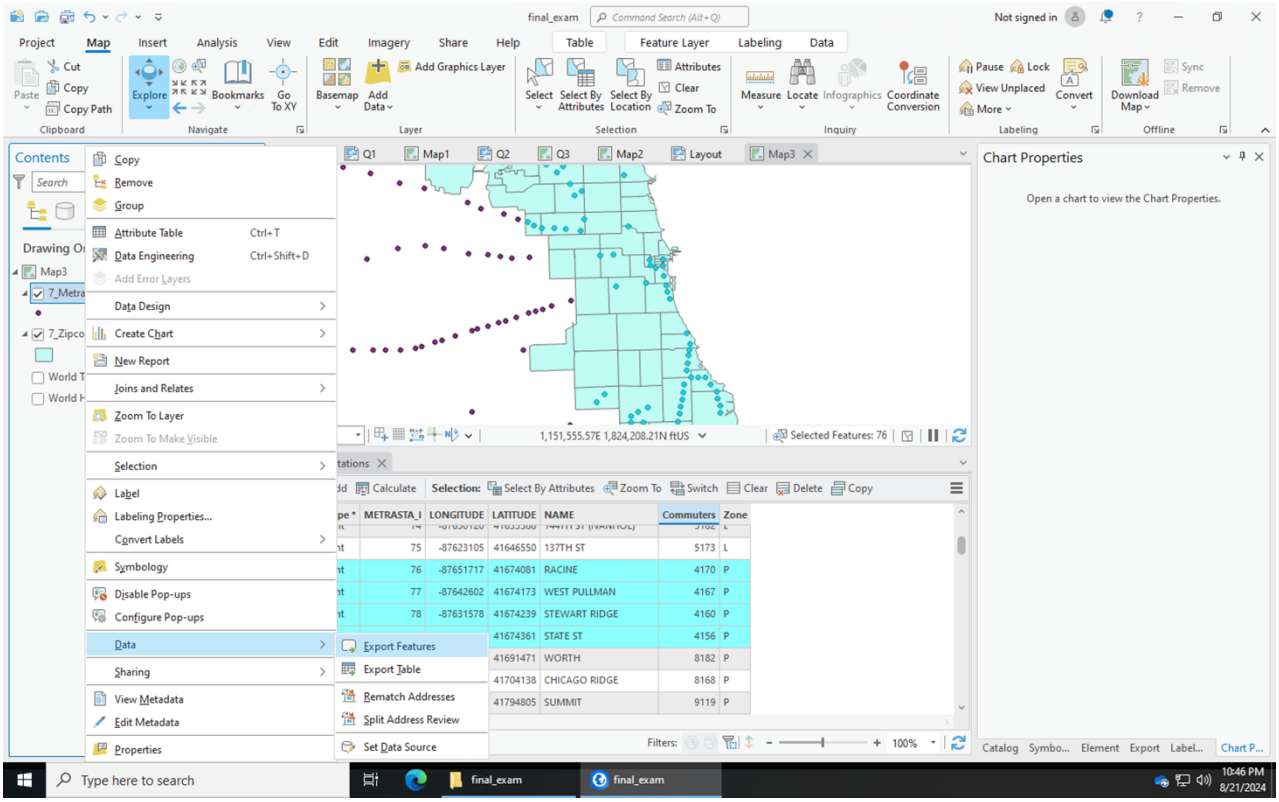
(b) Select all Metra stations that fall only within the Chicago. Export the Metra stations that fall only within Chicago into a new shapefile called MetraStations_Chicago.shp.

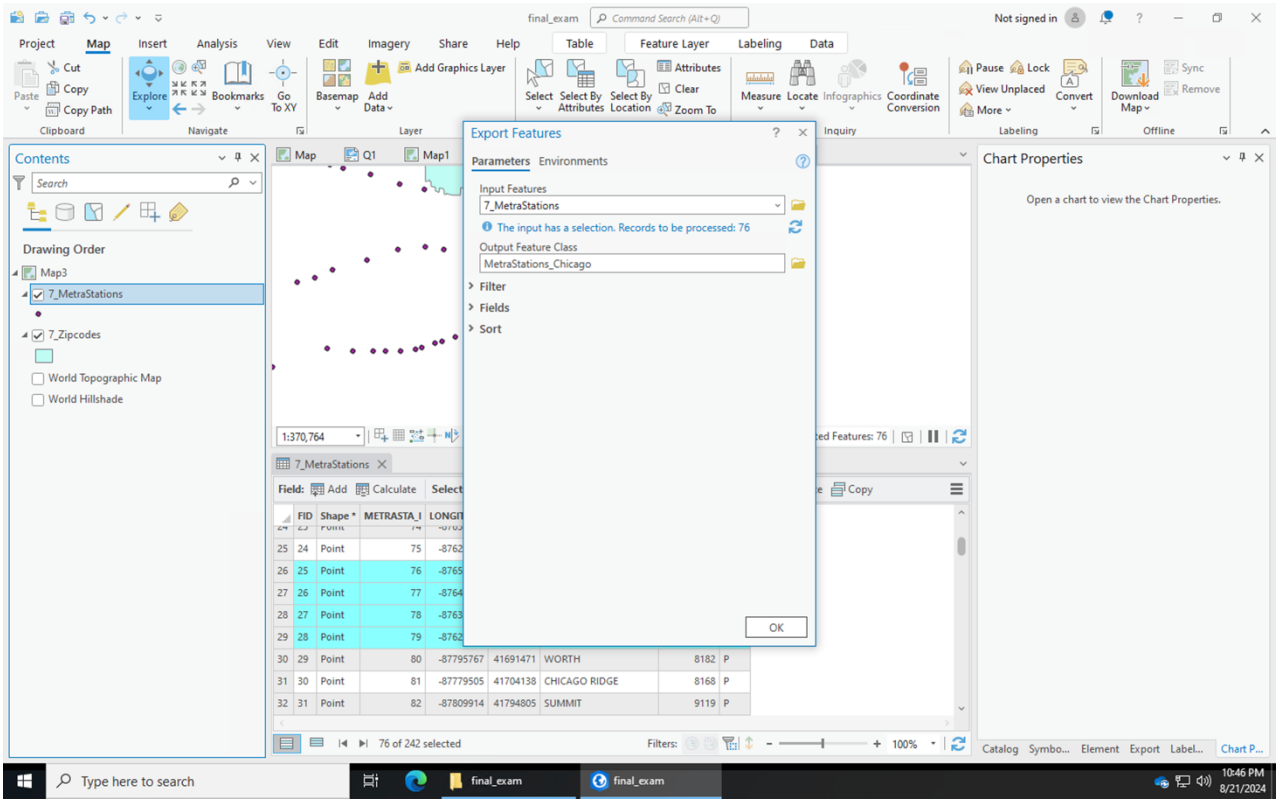
SCREESHOTS

1. **intersect the metra stations as input and zipcodes to obtain only those stations within the zipcodes**



2. **After selecting the required rows export to a new shapefile**

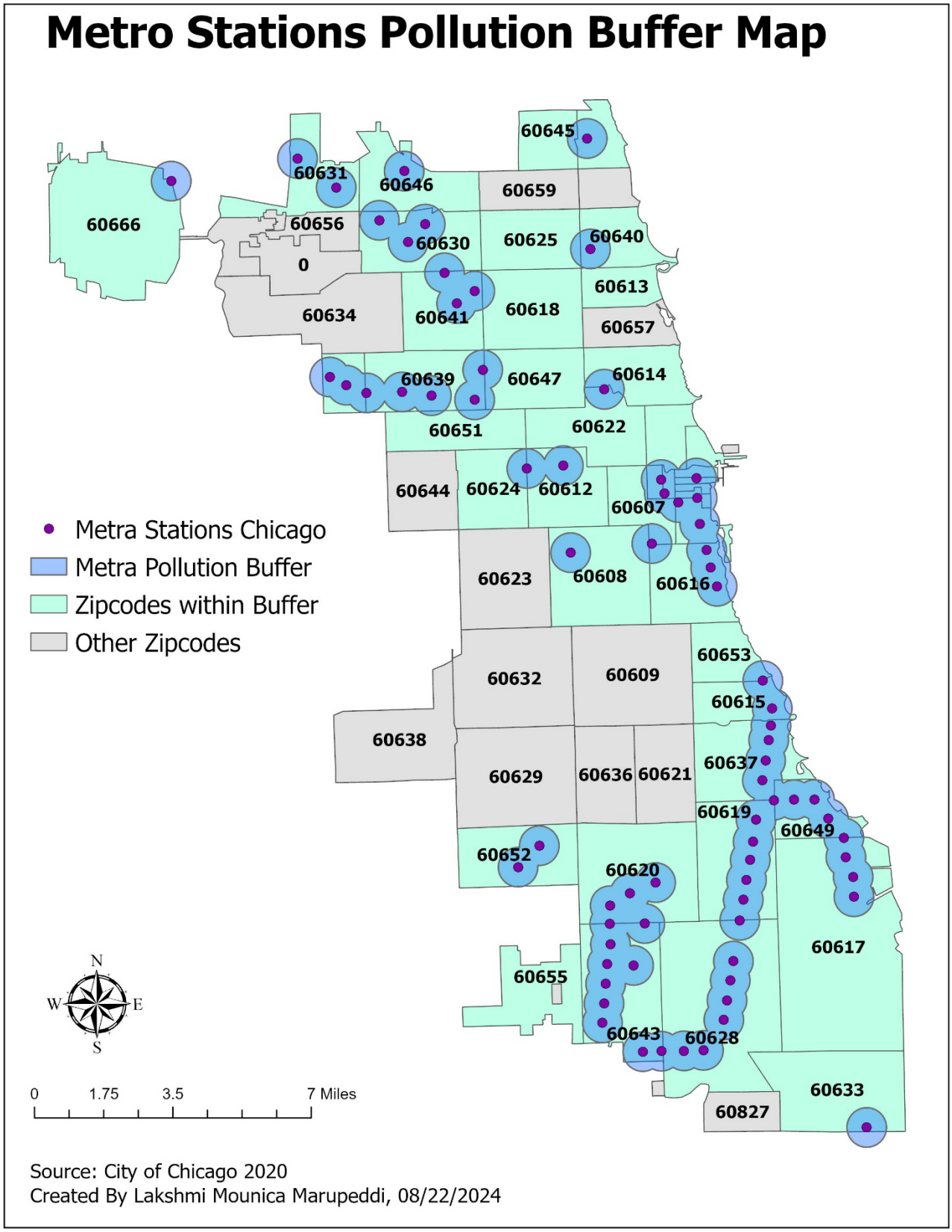




(c) A ½ mile buffer around MetraStations_Chicago.shp to help identify hotspot areas due to Metra train fume pollution.

(d) Export the selected zip codes into a new shapefile called Zipcode_Buffer.shp. Add it to the map and use an appropriate color to show the zip codes affected by pollution.

Map to show the 7_Zipcodes.shp, Zipcode_Buffer.shp, MetraStations_Chicago.shp and the buffer created.



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